



Pathology LAB 4

Neoplasm 1

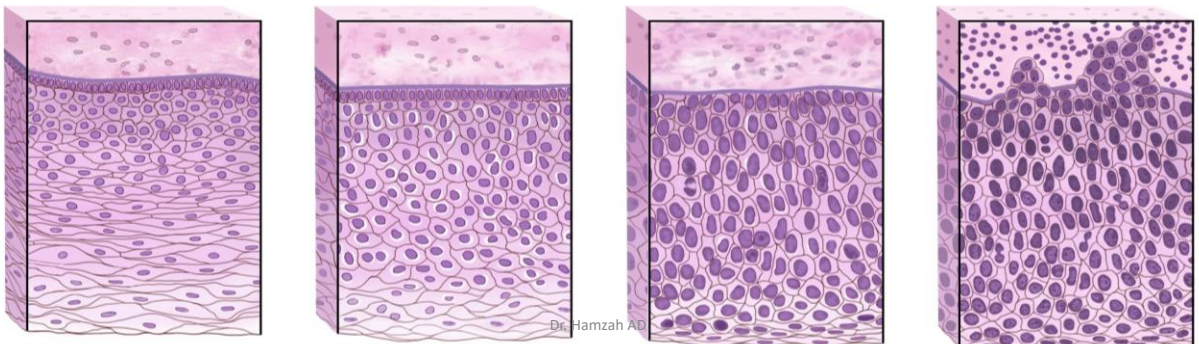
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Dysplasia

A **pre-cancerous** state, characterized by increased cell proliferation with highly abnormal and variable appearance to the cells. Cell to cell interactions are diminished, and the architecture of the tissue is less organized.

Dysplasia is potentially reversible, and it doesn't always progress to cancer, but it indicates a pre-cancerous state with a high probability of progressing to cancer.

Normal → **Hyperplasia** → **Dysplasia** → **Cancer**



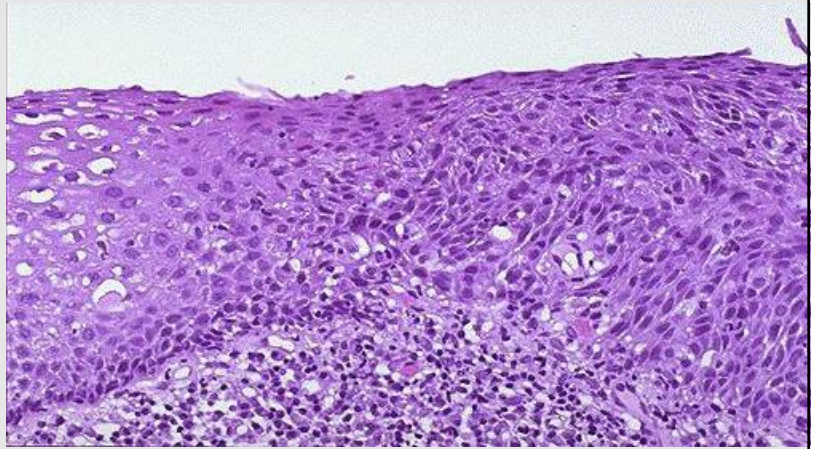


Dysplasia, high grade

Dysplasia of uterine cervix

Characteristic features:

1. Loss of differentiation
2. Lack of orientation



The **normal cervical squamous epithelium** at the left merges into the **dysplastic squamous epithelium** at the right in which the cells are more disorderly and have darker nuclei with more irregular outlines.

CHARACTERISTICS OF BENIGN AND MALIGNANT TUMORS

- Benign and malignant tumors can be distinguished from one another based on the degree of differentiation, rate of growth, local invasiveness, and distant spread.
- Benign tumors resemble the tissue of origin and are well differentiated; malignant tumors are poorly or completely undifferentiated (anaplastic).
- Benign tumors tend to be slow growing, malignant tumors generally grow faster.
- Benign tumors are well circumscribed and have a capsule; malignant tumors are poorly circumscribed and invade the surrounding tissues.
- Benign tumors remain localized to the site of origin, malignant tumors are locally invasive and metastasize to distant sites.

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Malignant Neoplasms

Cytologic features of malignant neoplasms include:

- Increased nuclear size (with increased nuclear/cytoplasmic ratio--N/C ratio).
- Variation in nuclear or cell size (pleomorphism).
- Lack of differentiation (anaplasia).
- Increased nuclear DNA content with subsequent dark staining (hyperchromatism).
- Prominent nucleoli or irregular chromatin distribution within nuclei.
- Mitoses (especially irregular or bizarre mitoses).

All of these features are "**atypical**" microscopic findings.

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Tissue of Origin	Benign	Malignant
One Parenchymal Cell Type		
Connective tissue and derivatives	Fibroma Lipoma Chondroma Osteoma	Fibrosarcoma Liposarcoma Chondrosarcoma Osteogenic sarcoma
Endothelium and related cell types		
Blood vessels	Hemangioma	Angiosarcoma
Lymph vessels	Lymphangioma	Lymphangiosarcoma
Mesothelium		Mesothelioma
Brain coverings	Meningioma	Invasive meningioma
Blood cells and related cell types		
Hematopoietic cells		Leukemias
Lymphoid tissue		Lymphomas
Muscle		
Smooth	Leiomyoma	Leiomyosarcoma
Striated	Rhabdomyoma	Rhabdomyosarcoma
Skin		
Stratified squamous	Squamous cell papilloma	Squamous cell or epidermoid carcinoma
Basal cells of skin or adnexa		Basal cell carcinoma
Tumors of melanocytes	Nevus	Malignant melanoma
Epithelial lining of glands or ducts		
	Adenoma Papilloma Cystadenoma	Adenocarcinoma Papillary carcinomas Cystadenocarcinoma
Lung	Bronchial adenoma	Bronchogenic carcinoma
Kidney	Renal tubular adenoma	Renal cell carcinoma
Liver	Liver cell adenoma	Hepatocellular carcinoma
Bladder	Urothelial papilloma	Urothelial carcinoma
Placenta	Hydatidiform mole	Choriocarcinoma
Testicle		
		Seminoma Embryonal carcinoma

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Carcinoma

Carcinoma: refers to a malignant neoplasm of epithelial origin or cancer of the internal or external lining of the body.

Carcinomas account for 80 to 90 percent of all cancer cases.

Carcinomas are divided into two major subtypes:

- 1. Adenocarcinoma:** which develops in an organ or gland.
- 2. Squamous cell carcinoma:** which originates in the squamous epithelium.

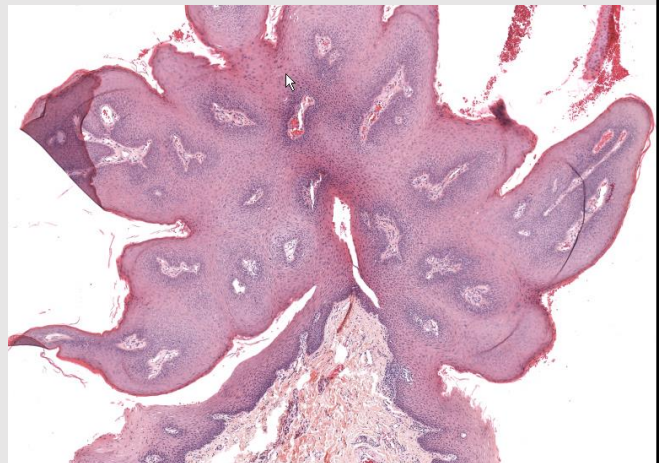
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Squamous cell papilloma

It is a benign papilloma that arises from the stratified squamous epithelium of the skin, lip, oral cavity, tongue, pharynx, larynx, esophagus, cervix, vagina or anal canal.

Squamous cell papillomas are typically associated with human papillomavirus (HPV) Types HPV-6 and HPV-11 while sometimes the cause is unknown.

Histopathology typically shows papillomatous protrusions and/or dysplasia.



Squamous cell papilloma



It appears as an exophytic mass made of cauliflower appearance. The lesion may be white, red, or normal in color. It appears as sessile or pedunculated mass.

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Squamous cell carcinoma

An elevated growth with a central depression that occasionally bleeds. It may rapidly increase in size.

A persistent, scaly red patch with irregular borders that sometimes crusts or bleeds.



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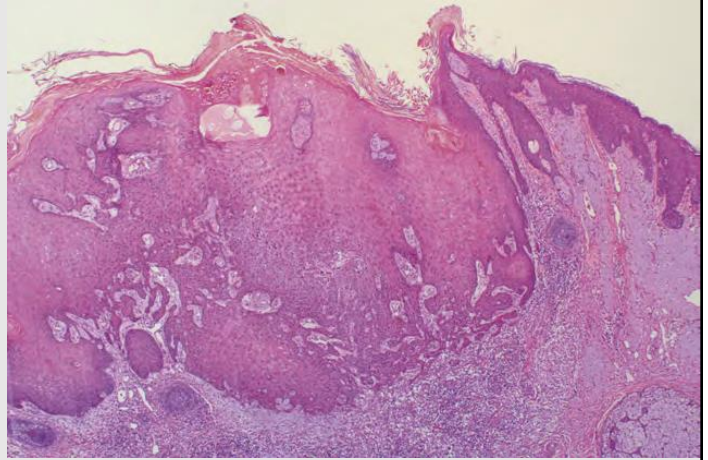
Squamous cell carcinoma

Histology of SCC

Typical SCC has nests of squamous epithelial cells **arising from the epidermis and extending into the dermis**.

The malignant cells are often large with abundant eosinophilic cytoplasm and a large often vesicular nucleus.

Variable keratinisation (keratin pearls etc) is present.



Typically SCC is graded as:

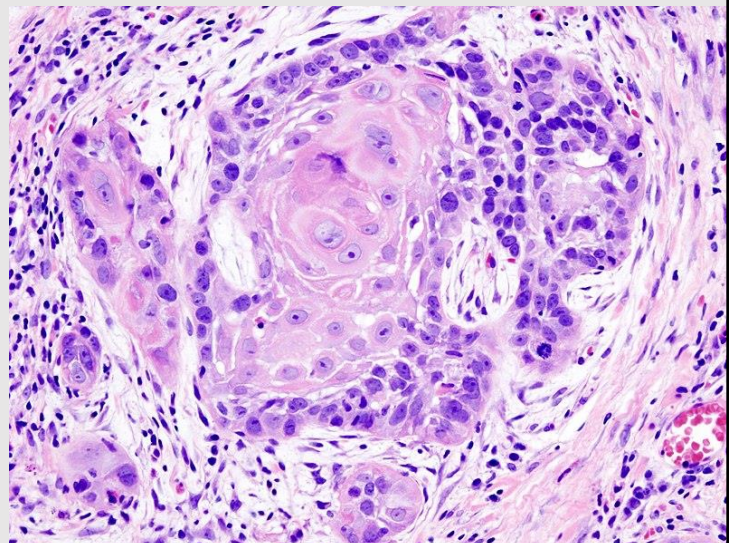
- Well differentiated.
- Moderately differentiated.
- Poorly differentiated.

Grading of SCC depends on how easy it is to recognize the characteristics of squamous epithelium (eg. Intracellular bridges, keratinisation), Pleomorphism and mitotic activity.

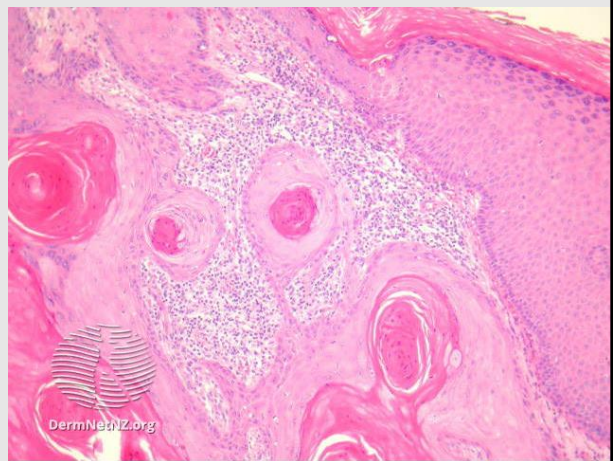
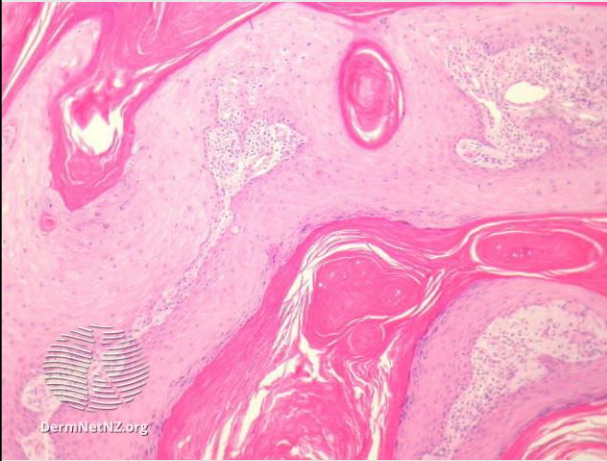
There is considerable inter-observer variation in grading SCC.

Histology of SCC

Typical SCC has nests of squamous epithelial cells **arising from the epidermis and extending into the dermis**. The malignant cells are often large with abundant eosinophilic cytoplasm and a large often vesicular nucleus. Variable keratinisation (keratin pearls etc) is present.



Squamous cell carcinoma, well differentiated

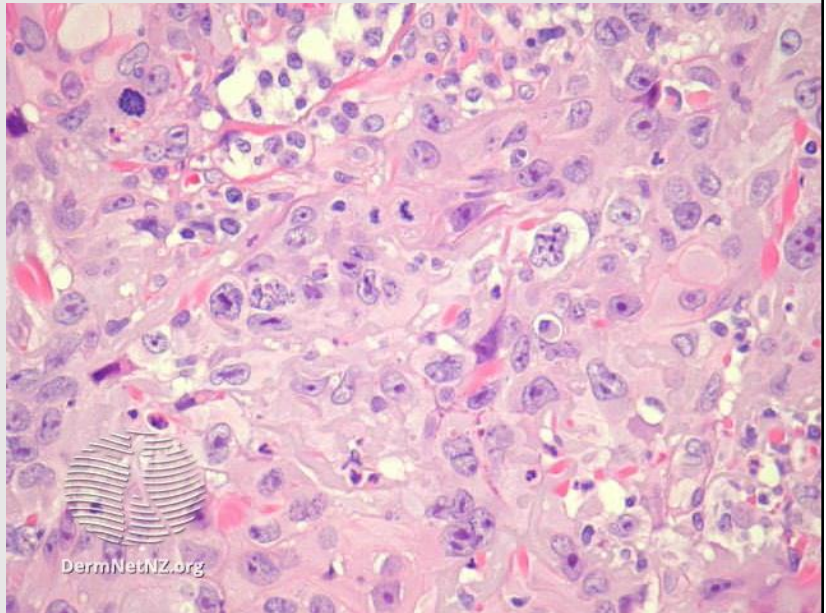


Well-differentiated squamous cell carcinoma of the skin.
The tumor cells are strikingly similar to normal squamous epithelial cells, with intercellular bridges and nests of keratin.

Squamous cell carcinoma, moderately differentiated



Squamous cell carcinoma, poorly differentiated



Fibroadenoma

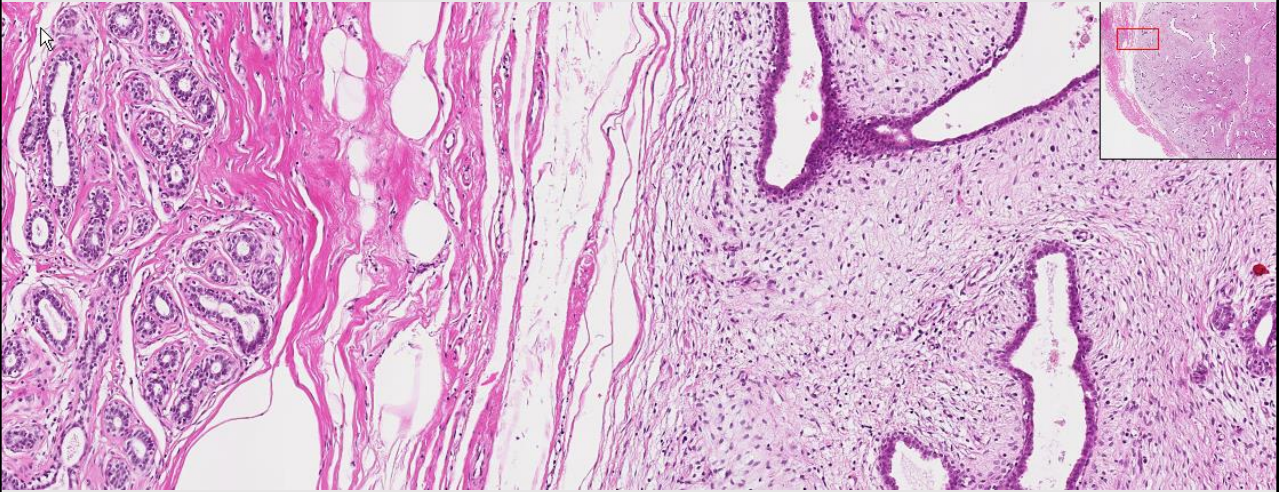
Fibroadenoma of the breast is a benign tumor of both stromal and epithelial components.



Fibroadenoma of the breast. The tan-colored, encapsulated small tumor is sharply demarcated from the whiter breast tissue.

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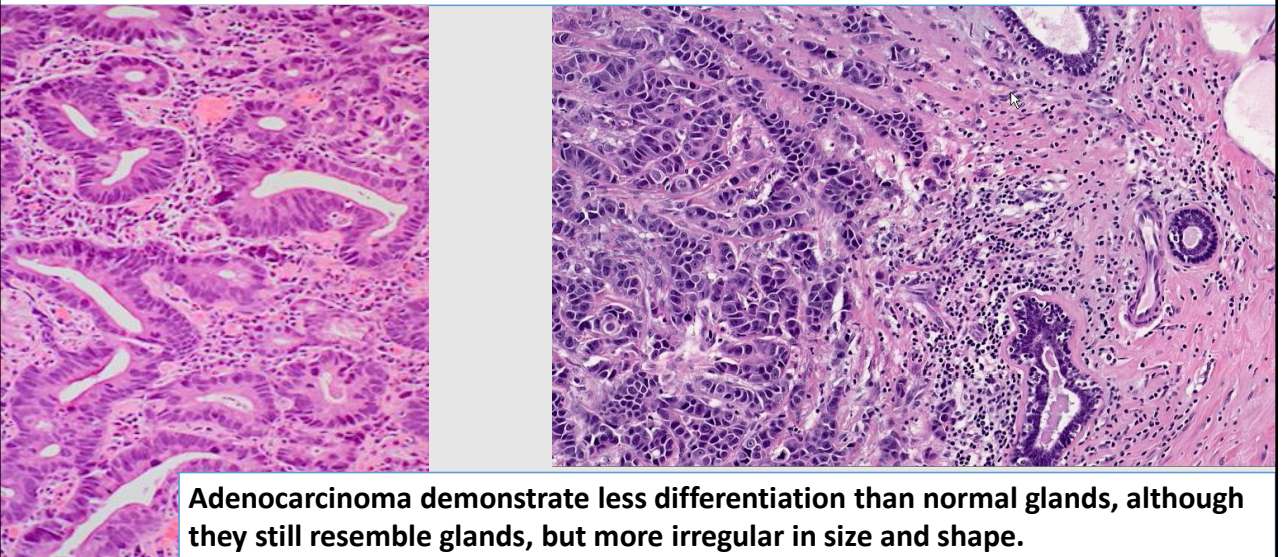
Fibroadenoma



The fibrous capsule sharply delimits the tumor from the surrounding tissue.

Adenocarcinoma

Adenocarcinoma is a type of cancer that starts in mucus-producing glandular cells of the body. Common types include: breast cancer, colorectal cancer, lung cancer, pancreatic cancer, and prostate cancer.



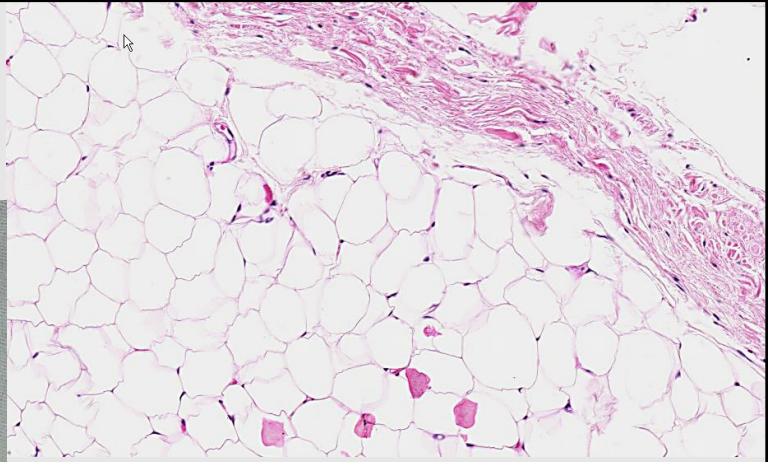
Adenocarcinoma demonstrate less differentiation than normal glands, although they still resemble glands, but more irregular in size and shape.

Lipoma

A **lipoma** is a benign tumor of fat tissue. They are generally soft to the touch, movable, and painless.



well circumscribed, slow growing, non-invasive, and closely resembles the tissue of origin (fat).

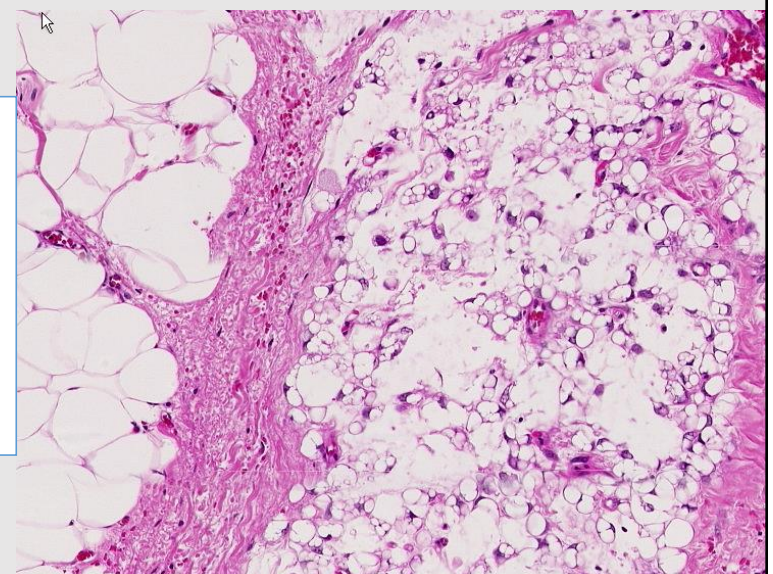


Lipoma at high magnification. This is a good example of how a benign neoplasm mimics the tissue of origin. These neoplastic adipocytes are indistinguishable from normal adipocytes.

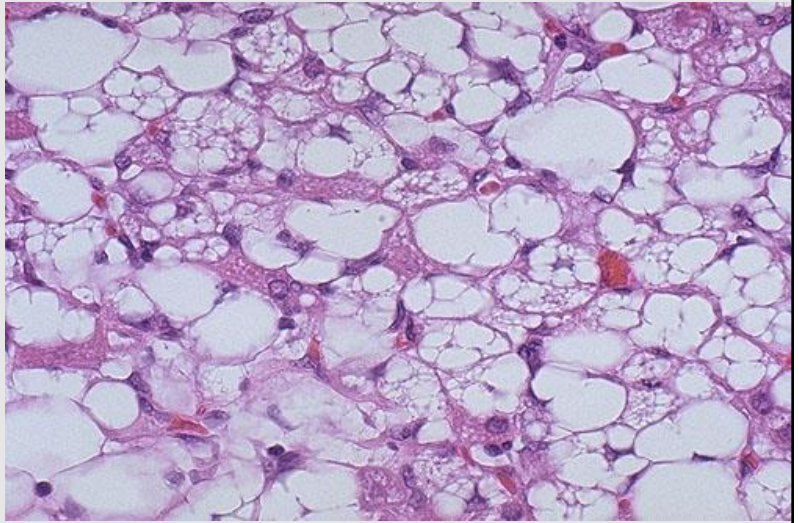
Liposarcoma

Liposarcomas are malignant tumors of adipose tissue. Liposarcoma is one of the most common sarcomas of adulthood. It occurs mainly in the deep soft tissues and retroperitoneum.

This liposarcoma has enough differentiation to determine the cell of origin (adipocyte), but there is still significant **pleomorphism** of these neoplastic cells (lipoblasts). Lipoblasts are often present; these are cells with an abundant clear multivacuolated cytoplasm and an eccentric darkly staining nucleus.



Liposarcoma



Lipoblasts with an abundant clear multivacuolated cytoplasm and an eccentric darkly staining nucleus.

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Metastasis?

Spread of Malignant Neoplasms

1. Direct invasion into surrounding tissues.
2. Lymphatic spread: typical of carcinomas.
3. Hematogenous spread: typical of carcinomas or sarcomas.
4. Within body cavities (seeding)--typical of neoplasms impinging upon body cavities, such as the peritoneal cavity.





Thank you..

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